

A
TREATISE
ON
SOAP-MAKING:

CONTAINING,
AN ACCOUNT OF THE ALKALINE MATERIALS;
TEST FOR DISCOVERING THE PRESENCE
OF AN ALKALI, &c.;

WITH
Full Directions for Manufacturing
YELLOW, PURE, WHITE, AND PERFUMED
HARD SOAP:

ALSO,
Complete Instructions for
THE MAKING OF GREEN OR SOFT SOAP:
With other Requisites necessary to finish the
SOAP-BOILER.

To which is added,
ABSTRACTS OF THE EXCISE LAWS RELATIVE
TO HARD AND SOFT SOAP-MAKERS.

BY A MANUFACTURER.

Permit not Poverty thy abodes t' invade:
Be gold expedient—study well thy trade.
Trust not yourself, but your defects to know:
Make use of ev'ry friend—and ev'ry foe.
Be niggards of advice on no pretence;
For the worst avarice is that of sense. POPE.

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TO THE READER.

THE author of the following Treatise would request the favour, that his intentions in producing this small, but, he trusts, useful piece, may be candidly imputed to his own real motives, viz. an endeavour of being useful to a large proportion of his Brethren in Trade, and not to an ostentatious show of exhibiting either his own abilities or education. Sensible of his deficiency in both, he humbly solicits, that the indulgent reader will have the goodness to take an opportunity of announcing any inaccuracies or mistakes

herein apparent to his conception, which shall in due time be taken into consideration, rectified, and the favour gratefully acknowledged. Had this been the production of what is denominated a scholar, or man of education, much room might have been found for exhibiting flowers of rhetoric and of learned philosophical explanations. So much, indeed, a display of these talents might have been exercised, as to render the book of more extensive magnitude, but, at the same time, obscure and unintelligible to the very class for whose instruction and information it is principally intended. Wrote by a tradesman, for the particular behoof of tradesmen, all technical terms are therefore carefully avoided; or, where such do necessarily occur, an illustration generally succeeds. That this book may prove useful,

will much depend upon the serious attention and strict observance of the matter therein laid down. The importance of its contents will more readily be discovered by those who have travelled a little in the path already, and have espied the darkness and dangers of the road. That great light may be thrown upon the subject, is the earnest wish and sincere desire of

THE AUTHOR.

P R E F A C E.

IT may appear something strange, that notwithstanding the numerous volumes hitherto published upon the different Arts, Sciences, and Manufactures, no practical account of SOAP-MAKING have as yet reached the eye of the Public. What this may be owing to, seem rather difficult to account for : it may be, that those few possessed of the secret, from a parsimonious, contracted, or selfish disposition, consider themselves

justly entitled to preserve, exclusively, that which have cost them, perhaps, much time, expence, and trouble, to acquire. Another, and more favourable reason, however, may be alleged ; that amongst these few, none have been urged by that degree of confidence in their own abilities, sufficient to induce them to set about a work in itself so mysterious and uncommon. Be that as it may, the author of the following pages could seriously have wished that this task had fortunately fallen to the lot of some other person much better qualified than himself. The idea, however, of retaining from our fellow-creatures that knowledge which the Great Disposer of all good have been pleased to lend us, only, is a notion so contrary

to the benevolent rules of Christianity, which is, *To do good and to communicate*, that the author feels himself peculiarly happy in having it in his power to obey so far the sacred injunctions, as with pleasure to communicate to others what they may stand in need of, or to the extent of his abilities bestow.

To obtain the knowledge necessary to complete a *Soap-maker*, must at all times be attended with a very considerable expence, besides the consumption of a large portion of time. No experienced Soap-boiler would consider it at all worth his attention, to undertake the instructing, in the fundamental principles of the art, any person under a premium of One Hundred Guineas, besides the benefit of the person's labour spent in

the acquirement. Common apprentices to soap-makers, acquire their knowledge from ocular demonstration only : they see how to prepare the materials, mix them together, set a cave, draw off and collect the leys therefrom, boil the same with tallow in the soap-pan :—the event ultimately is the production of soap.

They may also be instructed, under the eye of their master, or the boiler, occasionally, to finish a soap-pan. This last indulgence naturally creates in the apprentice, perhaps nearly out of his time, an impressive idea of his own finishing, or completion in the art of his trade. How wonderfully mistaken, however, many such have found themselves, when afterwards entrusted with

the sole charge and management of a soap-work, I shall leave to their own ingenuous bosoms to declare. I well know from experience what I have just advanced to be a positive fact.

The following Treatise, therefore, I consider as a handsome and valuable present to Soap-makers in general.—Any person possessing the means, and having an inclination to become Soap-maker, may, with this book before him, proceed immediately to work, without danger of going wrong, provided always the rules and directions therein inculcated be most scrupulously attended to.

I have commenced, in order, at the very first principles of the profession, as supposing the reader totally ignorant

of soap and its combinations, by giving a short account of the principal *alkaline materials* most universally made use of in the manufacturing of soap, and how they are to be treated, in order to extract therefrom the leys, or alkaline salts.

Secondly, I have pointed out how the hard materials may be analysed, or examined, in order to detect sand in their composition.

I next proceed to consider the leys, and to shew how they are to be weighed, and proved with regard to their strength, mildness, and causticity; consequently, to determine whether they are, or are not, fit for making soap.

After which I come, in course, to charge the pan, preparatory to a mak-

ing of Yellow Hard Soap, the operation of which is gone through in the most minute manner, explaining, as I proceed, every thing that may appear any ways dark to the understanding of a young beginner.

An operation of White Hard Soap, with the same peculiar minuteness, is also proceeded in, and described, with the grand secret of finishing for Pure White Soap, and how to scent or perfume the same.

It is also shown, how the perfume may be at an easy rate procured; with the method of preparing the Test for discovering the existence of an alkali in any liquid body.

After the conclusion of the observations on hard Soap, is inserted Two

Experiments accurately made on White Soap, upon a small scale, with a Calculation of the Expence, Profit, &c. attending the same; and a Table, shewing at one view the neat Amount of Duties to be paid to the Excise on any number of inches in the frame, from one to one hundred, and by which any other quantity, or number of inches, may be discovered.

For the benefit of those who may not be acquainted with casting up the same, a specimen of the work is also subjoined.

I then enter upon the operation of *Soft Soap*, exhibiting and explaining several makings as they actually took place, with descriptions of leys, &c.

By way of Appendix, and what is most essentially necessary for every Soapmaker to be intimately acquainted with, I have selected Abstracts of the principal Laws of Excise, peculiar to Hard and Soft Soap-makers :—The whole comprising a complete System of Soap-making, comprehending every thing needful in the trade for the Soap-boiler to be informed of.

The Author has only further to observe, that in prosecuting his business as a Soap-maker, he was uniformly in the practice, from an early period, of taking down notes in writing of every particular, or uncommon circumstance, that appeared to him material, in the course of his operations.

These remarks, for his further satisfaction, he from time to time submitted to trial, by various experiments upon a small scale : And by thus persevering, he flatters himself to have acquired a tolerable knowledge of the different phenomena so universally attendant on, and inseparably connected with, the process of Soap-making ; thereby rendering the whole at once clear, plain, and comprehensive.

In reviewing of late his jottings, he was forcibly impressed with this idea, viz. that these remarks and observations, being the result of above five-and-twenty years practical experience, might be of advantage, if made public, to the generality of his Brethren in Trade, especially those who have not

had an opportunity of being properly instructed in the fundamental principles of Soap-making.

These principles the Author considers to be a thorough knowledge of the nature and qualities of the original materials, leys, &c. used in the manufactory. It may in general be observed, that all bodies possessing a fixed alkaline salt, may be rendered useful in the making of Soap; but the chief, and what is commonly resorted to, are the following, viz. KELP, BARILLA, AMERICAN and St PETERBURG, POT and PEARL ASHES, DANTZIC, ENGLISH, &c.; with a short Account of which, from the best authorities, we shall commence this Treatise, and conclude the whole with a brief Dissertation on Spoiled Hard Soap, &c.

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A

TREATISE

ON

HARD & SOFT SOAP-MAKING.

ALTHOUGH it is not absolutely needful that soap-makers should know *where*, and *how*, their materials are originally produced ; yet it is essentially so, that he be acquainted with what is more intimately connected with his own real interest ; that is, how to detect frauds therein when made, and be enabled to judge of the strength, quality,

B

and fitness of such materials for his purpose, when prepared and brought to market.

These necessary precautions known, will guard the manufacturer at all times against every imposition, whether attempted in quality or price.

To obtain a perfect knowledge, or as much information with regard to alkaline salts as possible, ought to be the principal study of the soap-boiler. The whole art of the trade, the sole prospect of aggrandisement, depends upon, and must accrue from such knowledge well digested.

As the making of soap is the avowed purpose of this Treatise to explain, the doing so, by barely exhibiting the method of treating the materials in a soap-work, preparatory for using; of charging, boiling, and finishing a pan of soap, only, would be doing nothing; would be communicating no more information than any laboring man,

with a small degree of attention, in one of those works, may soon be master of. To complete the soap-maker, a far different, and more extensive degree of knowledge is necessary. An intimate acquaintance with the alkaline materials, and their consequents, the leys, ought to be attentively cultivated, so as to be rendered perfectly familiar; the nature, strength, quality, and fitness of such reduced to a demonstration, clear and simple. After these necessary acquirements are substantiated, soap-making, with the various phenomena incident thereto, will become exceedingly plain, easy, and comprehensive. We shall therefore commence this treatise, by giving a short explanation, by way of introduction, of the different alkalis, with their source of production; avoiding all extraneous or useless matter, that could only serve to swell the book, without communi-

cating any thing of importance to the soap-boiler.

Alkalis are of two kinds, *fixed* and *volatile*. The *fixed kind* are subdivided into two, the *vegetable*, and *mineral* or *fossile alkali*. The *vegetable* is so called, because it is procured from the ashes of burnt vegetables; the *fossile*, because it is found native in some places of the earth, and is the basis of sea-salt, and, in other parts, is dug out of mines in vast quantities.

They are called *fixed*, because they endure a very intense degree of heat without being dissipated in vapour, so as even to form a part of the composition of glass.

The *volatile alkali* is generally obtained by distillation from animal substances. In its pure state, this alkali is perfectly invisible, but affects the sense of smelling to such a degree as not to be approached with safety.

The acids and alkalis are generally thought to be entirely opposite in their nature to one another.

Some, however, imagine them to be extremely similar, and to be as it were parts of one substance violently taken from each other. Certain it is, that, when separated, they appear as opposite to one another as heat from cold.

Their opposite action, indeed, very much resembles that of heat and cold, even when applied to the tongue; for the alkali has a hot, bitter, burning taste, while the acid, if not considerably concentrated, always gives a sensation of coldness. In their action, too, upon animal substances, the alkali dissolves, and reduces the part to a mucilage (or clammy, glutinous, ropy substance); while the acid, if not very much concentrated, tends to preserve it uncorrupted. If an alkaline salt, and moderately strong acid, in

a liquid state, be mixed together, they will immediately unite ; and, provided the alkali has not been deprived of its fixed air, their union will be attended with a very considerable effervescence, or seeming fermentation.

If the alkali has been deprived of air, no effervescence will ensue, but they will quietly mix together ; but, if a due proportion of each has been added, the liquor will neither have the properties of an acid nor an alkali, but will be what is called *neutral*. The bringing the liquor into this state is called *saturating the acid, or alkali, or, combining them to the point of saturation*.

If the liquor, after such a saturation, be gently evaporated, a saline mass will be left, which is neither an acid nor an alkali, but a new compound, formed by the union of the two, and which is called a *perfect neutral salt*. The epithet *perfect* is given it,

to make a distinction between the salts formed by the union of an acid and an alkali, and those formed by the union of acids with earthy or metallic substances ; for these will likewise unite with acids : and some of the compounds will likewise crystallise into regular figures ; but because of their weaker union with these substances, the salts resulting from combinations of this kind are called *imperfect*.

All acids, the volatile sulphurous one excepted, change the blue infusions of vegetables, such as violets, to a red ; and alkalis, as well as some of the imperfect neutrals, change them to a green.

This is the nicest test of an acid or alkali abounding in any substance, and seems the most proper method of determining whether a solution, intended to be neutral, really is so or not.

The two great divisions of salts are, into *acids* and *alkalis*. The *first* of these are known by their peculiar taste, which are called *acid* or *sour*. They are not found in a solid form ; neither are any of them, except the acids of vitriol, of tartar, of phosphorus, and of borax, capable of being reduced to solidity.

The others, when highly concentrated, that is, brought to the utmost degree of strength of which they are capable, always become an invisible vapour, permanently elastic, until it comes in contact with water, or some other substance with which they are capable of uniting.

For such acids the name of *salts* seems less proper, as we can scarcely say that a vapour which is already much more fluid than water can be dissolved in that element.

Both *vegetable* and *mineral alkali* appear to be composed of an exceedingly caustic

salt, united with a certain quantity of fixed air. This may be increased so far as to make the vegetable alkali assume a crystalline form, and lose great part of its alkaline properties. But, as the adhesion of great part of this air is very slight, it easily separates with a gentle heat.

The only method of depriving it of its fixed air entirely, is by mixing an alkaline solution with quicklime.

The *alkaline salts* for the use of the soap-boiler, are produced from the following materials: The first of which to be noticed is that well-known article, the produce of our own sea-shores, &c. called *kelp*.

From the large quantity of alkali therein contained, it is very justly esteemed an excellent and useful material in hard soap-making. The best of this article is made from seaweed, or weed, cut from the rocks of the shores at low water-mark, not under four

or five years old, and distant from a communication with fresh-water rivers. All the sand ought carefully to be washed from the ware when cutting, and the remainder, if any, shaken off while drying.

Particular attention should be had that no sand be mixed in the kiln when burning. The pernicious effects of sand are twofold ; *first*, robbing the purchaser, making him pay for sand instead of kelp ; and, *2dly*, what is still worse, kelp burnt with sand is converted into a kind of vitrified substance, and from which it is next to impossible for the soap-maker to extract the alkali.

Kelp is always esteemed the best which is hardest, finest grained, and free from sand or earth. Sea-ware is a most useful article otherwise, besides the making of soap : it is an excellent manure for land, for which purpose it is often applied in the maritime parts of Scotland and other countries.

In the island of Jura and Skye, it frequently serves as a winter food for cattle, which regularly come down to the shores at the recess of the tides to seek for it. In Gothland and Sweden also, the inhabitants boil it in water, and mixing therewith a little coarse meal, feed their hogs with it. And we are informed, that in Jura, and some other of the Hebrides, the inhabitants dry their cheeses without salt, by covering them with the ashes of this plant. These ashes abound with such quantity of salts, that from five ounces of them, may be procured two ounces and a half of fixed alkaline salt, that is, half of their whole weight.

But the most beneficial use which such sea-weed can be put to, in the way of œconomy, is in making kelp; a work much practised in the Western Isles, Orkney, Shetland, Norway, &c.

I shall next take notice of an article peculiarly adapted to *white soap-making*, although equally good for *yellow*. It is the produce of the kingdom of Spain, at least the best is from that country, and called

BARILLA.

The description we meet with of this plant is as follows, viz.

Barilla, or *barilha*, the name of a plant cultivated in Spain for its ashes, from which the purest kinds of alkali are obtained.

There are four plants which, in the early part of their growth, bear so strong a resemblance of each other, as would deceive any but the farmers and nice observers. These four are, *barilla*, *gazul* (or, as some call it, *algazul*), *soza*, and *salicornia*, or *salicor*. They are all burnt to ashes, but applied to different uses, as being possessed of

different qualities. Some of the roguish farmers mix more or less of the three last sort with the first ; and it requires a complete knowledge of the colour, taste, and smell of the ashes, to be able to detect their knavery.

Barilla is sown fresh every year ; its greatest height above ground is four inches ; each root pushes out a vast number of little stalks, which again are subdivided into smaller sprigs, resembling samphire * ; and altogether form a large, spreading, tufted bush. The colour is bright green. As the plant advances to maturity, this colour vanishes away, till it comes at last to be a dull green, tinged with brown.

* *Samphire*, or *St Peter's Herb*, a plant which generally grows upon rocky cliffs in the sea. It is usually pickled, and eaten for a dainty dish.

Gazul bears the greatest affinity to *barilla*, both in quality and appearance. The principal difference consists in its growing on a still dryer, salter earth, consequently it is impregnated with a stronger salt. It does not rise above two inches out of the ground, spreading out into little tufts. Its sprigs are much flatter and more pulpy than those of *barilla*, and are still more like *samphire*. It is sown but once in three, four, or five years, according to the nature of the soil.

Soza, when of the same size, has the same appearance as *gazul*, but in time grows much larger, as its natural soil is a strong salt marsh, where it is to be found in large tufts of sprigs, treble the size of *barilla*, and of a bright green colour, which it retains to the last.

Salicor has a stalk of a deep green colour, inclining to red, which last becomes by degrees the colour of the whole plant.

From the beginning it grows upright, and much resembling a bush of rosemary.

Its natural soil is on the declivity of hills, near the salt marshes, or on the edge of the small drains or channels made by the husbandmen for the purpose of watering the fields. Before it has acquired its full growth, it is very like the barilla of those in which the ground has been dunged before sowing. In these years of manuring, barilla, contrary to its usual nature, comes up with a tinge of red; and when burnt, falls far short of its wonted goodness, being bitter, more impregnated with salts than it should be, and raising a blister, if applied a few minutes to the tongue.

Barilla contains less salt than the others. When burnt, it runs into a mass resembling a spongy stone, with a faint cast of blue.

Gazul, after burning, comes as near barilla in its outward appearance, as it does

when growing in its vegetable form ; but, if broken, the inside is of a deeper and more glossy blue. Soza and Salicor are darker, and almost black within, of a heavier consistence, and very little or no sign of sponginess.

All these ashes contain a strong alkali, but barilla the best and purest, though not in the greatest quantity. Upon this principle, it is fittest for making glass, and bleaching linen. The others are used in making soap. Each of them would whiten linen, but all, except barilla, would burn it.

The method used in making barilla is the same as that followed in Britain in burning kelp.

The plant, as soon as ripe, is plucked up, and laid in heaps, then set on fire ; the salt juices run out below into a hole made in the ground, where they collect into a vitrified

lump, which is left about a fortnight to cool. An acre may give about a ton.

AMERICAN POT-ASH

Is a fixed vegetable alkali, another valuable material in hard soap-making, prepared from the ashes of burnt wood in America, Russia, &c. The process of preparation is nearly as follows.

A quantity of wood being burnt to ashes, these, while hot, are raked together into a heap, in which state they remain for ten or twelve hours. The purpose of this is, to give the embers, or black bits of the wood, sufficient time to dissolve, and be thoroughly converted into a white ash. These white ashes are boiled with water, for the purpose of extracting the salt. This water being drawn off, is again boiled, and evaporated in a broad pan, over a strong fire, until the whole is reduced to a perfect dry salt.

In this state, the salt is thrown into a proper fluxing furnace, where they are converted by a strong heat into a red hot mass. This is drawn off by means of a hole in the side of the furnace, and received into iron, or other moulds, and left to cool. When cold, the lumps are broke up, and packed in close casks for exportation, being then completely ready for use. Most other ashes of the pot kind are prepared after a similar process ; it is therefore unnecessary here to say more respecting them.

There is also a second and third sort made ; but these are in general so full of refuse, especially the last, as to render them of little or no consequence to soap-makers.

Having mentioned a few of the principal, and certainly the best ashes used in the manufacturing of hard soap, we shall turn for a little our attention to the mode used for detecting sand therein.

This low, dirty, and abominable fraud, is but too frequently practised, not only by kelp-burners, but barilla-makers also ; that is, mixing sand with their commodity while manufacturing, and in a liquid state.

The process I have used for detecting sand is simple, and not tedious, viz. take two ounces of a fair sample from any parcel meant to be purchased ; beat it down in a mortar very small, pour some boiling water upon it, and rub it well in the mortar ; pour off this, and add more, and so continue until all the black light substance is gone off with the water. The sand will then be found in the bottom of the mortar, and, if surveyed with a magnifier, will resemble in appearance small pebble stones, or channel, of various colours. Dry and weigh the sand ; and from the quantity contained in the two ounces, a calculation may be made for the hundred weight or ton.

A certain given quantity of water ought always to be allotted for trying this experiment ; say, one or two pints : and by weighing one pint thereof afterwards, when the experiment is finished, the quantity of alkaline salt may also be discovered which one pint of said ley contains ; thus, an English pint of spring water weighs 15 oz. 3 drs. 12 gr., so that all above that weight in the rubbing water, or ley, must be supposed alkaline salt. The price of the article ought to be regulated according as the experiment turns out.

From these ashes already mentioned, the strongest and purest vegetable alkali is obtained. From other vegetables, as fern, broom, bean-stalks, &c. an alkaline salt is produced, but so impure, and in such small quantities, that no soap-manufacturer in this country can use them, with any reasonable expectation of profit.

The other ashes (although sometimes used in hard soap-making, are more proper for bleaching linen, being preferred for their whitening quality, and mildness of the alkali), are the following :

BLUE PEARL ASHES.

These appear to be a pure alkaline salt, mixed with a small quantity of vitriolated tartar and earth. Half a pound of these will give about $5\frac{1}{2}$ ounces of pure salt.

WHITE PEARL ASHES.

Are nearly of the same quality with the former, half a pound of them giving five ounces and seven drams of pure salt, with some vitriolated tartar and earth.

RUSSIA, OR MUSCOVY ASHES,

Have very much the appearance of slaked lime, and are, like it, friable, or may be powdered or crumbled betwixt the fingers. Half a pound of them will only give about ten drams and fifteen grains of a very caustic salt. These consist, therefore, of a small quantity of alkaline salt, united with a large quantity of lime.

CASHUL ASHES

Are of the colour of iron-stone, and extremely hard, with many shining particles of charcoal in them. They have a saline taste, with a considerable degree of pungency or prickling heat. Half a pound of these ashes being boiled in a quantity of

water for twenty-four hours, and evaporated, produced only ten drams of a brown salt, having a strong caustic alkaline taste. Upon examination, they appear to contain an earth half vitrified, some lime, alkaline salt, and a quantity of sulphur.

MARCOFT ASHES

Are of a paler colour than the former, with some small pieces of charcoal in their composition. Half a pound of them dissolved in water, filtrated and evaporated, yielded only eleven drams one scruple and two grains of alkaline residuum.

The blue and white pearl ashes, discovered by experiment to be pure alkaline salts, without any considerable mixture of heterogeneous bodies, may be used in hard soap-making, mixed with kelp or barilla, with certain success. When used alone, a large

quantity of common salt is necessary; nor is the soap ever so firm and hard as when they are combined with kelp, &c.; and soap made with these ashes alone, is always apt to get softer by age. Upon this account, pearl ashes seem much better calculated for soft, or green soap, than hard. A boil, however, with these pearl ashes, after the rosin have been melted, is peculiarly serviceable for killing the tallow, (according to the common phrase); it converts the whole mass in the pan to a consistence, or thin weak soap. But this will be better understood when we come to the operation of boiling or making the soap; a process which we shall immediately set about.

Let us now suppose that every thing is ready for commencing the operation upon a moderate scale, viz. that there is a small soap-pan, capable of casting from 20 to 24 cwt. of soap, six or eight iron vats, or caves,

with receivers that will contain 12 or 14 cwt. of kelp or ashes, each ; that there is also kelp, ashes, tallow, lime-shells, and palm oil at hand. These are all the materials necessary for performing the operation, and finishing a pan, or making of hard soap.

The first thing to be done is, to prepare for setting a cave, *viz.* Break down very small about 12 cwt. of kelp, and, to make a good ley, 2 or 3 cwt. of American pot-ash may also be broke and mixed therewith. Barilla ash is generally set by itself alone. The breaking, however, of the American pot-ash, from the danger of sparks (if great care is not taken) of flying into the eyes, or lodging about the feet, &c. would be as well altered to melting down, or dissolving in boiling water, and then poured upon the other materials (just now to be mentioned), after they are put into the cave.

- The kelp now broke, spread about one-sixth part of it upon the floor, or slake-pit, if there is one, upon which lay about half a bushel lime-shells, and water them. When the shells begin to burst and crack, put on another layer of kelp, then more shells, and water them ; and so on, stratum *super* stratum, or one above the other, until there is about the quantity of $2\frac{1}{2}$ or 3 American ash barrels of shells mixed with the 12 cwt. of kelp. Let this stand for the space of two hours. The cave in the interim may be got ready for receiving them, thus : Lay two rows of bricks upon the bottom, from the hole or pipe quite across to the opposite side, forming therewith a small channel, of three or four inches breadth. Cover this over with any convenient thing, such as slate, tyle, a piece of dale, &c. And to crown the whole, lay on some straw, or an

old bass mat, &c. This is to prevent the grosser parts of the materials from getting in and stopping up the channel, intended only for the leys to run in. Stop up the pipe, or hole in the cave, with a pin, about which ought to be lapt a piece of paper to keep all close.

These preparations now accomplished, we proceed to what is generally termed,

Sub-
SETTING A CAVE. *Ley Tub*
Tub

The principal object here to be observed, is to mix the compound well together, previous to putting into the cave. The first bucket or two should be very gently laid upon the covered drain, or bottom of the cave. This will secure the straw, or mat, from being disturbed afterwards, by throwing in the rest of the materials.

Throw on two or three pales of water, at different periods, during the setting, which will have the effect to dissolve any small particles of the shells that may formerly have escaped the water. Observe always to leave a vacancy at the top of the cave, of about eight or ten inches at least, in order to give room for swelling of the lime, and filling up with water.

Supposing now the kelp and lime all put into the cave, and no American ash therewith, but that these ashes have been melted down, or dissolved in boiling water, and are converted into a ley; pour that upon the top of the other materials just put into the cave, and fill up with water until the whole is completely saturated therewith; the completion of which will be evident, when the bubbling in the cave ceases to arise. Let the whole now stand for 12 or

14 hours, adding, however, a little more water as the stuff appears to dry up, or absorb that already put on. When the cave has stood the above time, loose the pin, and let the ley run briskly off. When all is off, stop up again, and fill with water, which may stand the half of the former time ; the pin may again be loosed, and the leys allowed to run gently off, keeping the cave always filled up or supplied with water. It may be unnecessary here to remark, that we must hitherto be supposed as laying down directions to a person just going to commence soap-making, but perfectly ignorant of the operation, and that he is preparing every necessary agreeable thereto. In that case, descending to particulars will, I hope, be excused by the knowing, or more experienced reader.

We shall now go on by informing, that before beginning to boil, more leys must be

got ready ; consequently, another cave may be prepared in the same manner as the former one ; with this exception only, that, instead of filling up, or supplying the second cave with pure water, let it be run through the former cave first, and then put upon the second. The intention of this is obvious ; that, while the last is supplied with water, the remaining strength of the first is extracted, and collected into the second ; and this must be the uniform practice at all times, that none of the alkali be lost ; never turning out a cave, as spent, until you discover by the test the alkali is vanished.

Having just mentioned the *test*, I shall take this opportunity of explaining what it is.

The *test* is a thing so necessary for a soap-boiler, that it is impossible for him to conduct his operations with propriety without

it ; yet, I believe, there are hundreds in the trade that know nothing at all about it : be that as it will, I say, they ought to know it ; nor can any man discover when a soap-ley is totally deprived of its alkali, without its assistance.

It is prepared in the following manner : Take a parcel of the blue flowers of any vegetable, violets, for instance, or the blossom of the mallow ; beat them with the edge of a knife, and squeeze the juice of it into a tea-cup ; with a small brush, or hair pencil, lay over a sheet of white paper with this juice, and when dry it is fit for use. All alkalis will turn it green, and all acids will turn it of a red colour. A combination of them both to the point of saturation, will not in the smallest degree alter the colour of the test, because they are then said to be neutral, having neither the properties of an a-

cid, or an alkali ; but add a few drops more, of either the one or the other, the effect will be evident. If alkali is added, the test will be green ; if acid, it will be red.

An intimate acquaintance with every particular relative to the leys, is the one thing needful for a soap-boiler, being as it were the ground-work of the whole operation, and materially essential to be well understood, before any attempt ought to be made at soap-making.

We come now, of course, to examine the leys already prepared, and to determine by experiment whether they are, or are not, fit for soap-making ; that is, whether they are caustic and fit, or in a mild state, consequently unfit for the purpose.

Unless a soap-ley be rendered caustic, or deprived of its fixed air, it can have no natural attraction for vegetable or animal sub-

stances, such as oil, tallow, or grease of any kind, so as to convert them into a soap. For the sole purpose, therefore, of extracting the fixed air from the leys, do soap-makers use quicklime. Depriving the mild alkali of its fixed air, renders it caustic, or of a burning, corroding quality, and of that peculiar nature that instantly attach themselves to all greasy substances, and converts them into soap.

The common vulgar notion, of using quicklime for its heat, is a mistaken idea, although I know it to be entertained by many soap-makers. Our most celebrated professors of chemistry *, when preparing a soap-ley, generally slake and sift their lime ; consequently, banish entirely all regard for heat in the lime ; using warm water rather.

* See Dissertation on Spoiled Hard Soap, APPENDIX.

A mild ley, or that possessing fixed air, can have no effect upon vegetable or animal substances, so as to convert them into a soap.

Hence we may perceive the pernicious practices of some soap-boilers, (or pretend-ers to be so), namely, melting down, or dissolving American ash in boiling water, and, in that mild and improper state, adding those leys to the boiler.

Such consummate ignorance persevered in, must, and always have proved ultimate ruin to the person himself, or his unfortunate employer.

To determine, therefore, the proper state of the ley, take a quantity in a glass, or tea-cup, drop therein a few drops of vitriolic acid, or oil of vitriol; if this causes an effervescence, or seeming fermentation in the ley, the fixed air is not fully extracted; but, if

no such appearance ensue upon the combination of the acid and alkali, the ley is fit for immediate use, being arrived at the state of a proper caustic soap-ley.

A soap-ley, by being long exposed in open vessels, will lose the whole of its causticity, and seem entirely restored to the state of an ordinary fixed alkali. The keeping them as close as possible, therefore, appears exceedingly necessary.

By means of the acid may be discovered also the comparative strength between one ley and another, and so ascertain which of the two contains the greatest quantity of fixed alkaline salt. Thus, take a specific quantity of each; a wine glassful, for instance; drop therein a dozen drops, or so, of acid; stir with a bit stick, and apply a slip of the test-paper. If it appear green, more acid must be added, and stirred again. Applying the test a second time, if still

green, a few more drops must be added; and so continue, until you find the paper is by no means altered in the colour, neither green nor red. The ley is then neither an acid nor an alkali, but neutral, or a combination of both, brought to the point of saturation. A few drops more of the acid, would occasion the test-paper to take a red, instead of a green colour, which would distinctly show the power of the acid to prevail.

Treating in this manner the different leys, then counting the number of drops taken to neutralize them, the strongest ley will be discovered to be that which have required the greatest quantity of acid, to overcome the power of the alkali.

Soap-leys are also judged of by their specific gravity, or weight, comparative to water.

oz. dr. gr.

An English pint of spring water
weighs about 15 3 12

A strong soap-ley, the English
pint, weighs about 17 6 24

The difference between the two is, . 2 3 12
—and supposed to be the quantity of fixed
alkaline salt contained in one pint of such
ley.

A most accurate and easy method for ascertaining the strength of soap-leys for immediate use, is as follows, viz.

Take a small bottle, and having filled it with water, put it into one scale, and as many small lead-shot into the other as will exactly balance it. Suppose 128 is requisite for that purpose. Suppose, again, that the bottle and water just weighs 4 ounces; this is throwing it into 128 parts; half of that is $\frac{64}{1}$, or 2 ounces; half it again,

is $\frac{3^2}{2^8}$ parts, or 1 ounce ; again, is $\frac{16}{128}$ parts, or 8 drams ; then into $\frac{8}{2^8}$ parts, or 4 drams ; $\frac{4}{2^8}$ parts, or 2 drams ; $\frac{2}{2^8}$ parts, or 1 dram ; and $\frac{1}{2^8}$ part, or half a dram, which is bringing it to the lowest denomination.

Get proper weights made for each of these divisions ; and when the strength of the ley at any time is required to be ascertained, fill the bottle, and put it into the scale : into the opposite one, the balance of water, or the 128 shot, is placed ; and as ley is always heavier than water, some one or other of the divisions will be wanted to balance the ley : therefore, whatever division may answer for that purpose, must be called the weight of the leys ; the surplus weight above that of water being only reckoned, and not the whole quantity : For instance, if the bottle of ley take the division weight

NO 16, in that case the ley is $\frac{16}{18}$ parts heavier than water, or 8 drams, reasonably supposed to be alkaline salt.

Notwithstanding that various sorts of alkali are enumerated, it is supposed that there is but one alkaline principle in nature, which, by being variously combined with sundry substances, assumes various particular properties. However, an alkali is never found pure in nature, but it is always combined with other substances, from which it must be separated by art, in order to obtain it sufficiently pure. The fixed alkali is obtained either from sea-salt, or from vegetables; hence it is called *fixed mineral alkali* in the first case, and *fixed vegetable alkali* in the second.

Having in the foregoing pages endeavoured to furnish the attentive reader with a tolerable idea of the preliminaries of soap-making, we shall now proceed to what I consider the

easiest and most simple part of the business; the boiling; although by the ignorant and unwary conceived to be the principal requisite, and containing the whole mystery of the trade. As a proof of which, I take the liberty to mention, that it is within the compass of my knowledge, of several instances having occurred, where common excisemen, from their mere observations taken while attending, in the line of their duty, upon a soapwork, have had the daring presumption to pretend a complete knowledge of soap-making; in consequence of which, have had the address to induce several individuals of fortune to risk their money in an unknown and dangerous undertaking, confidently relying upon the false skill of those self-taught gaugers as conductors and managers.

A short time, however, was always sufficient to convince, by woeful experience,

such unfortunate gentlemen of their own error and their managers ignorance.

The leys being now ready, we shall commence with a boiling of *brown* or *yellow soap*. For this purpose, let there be weighed 10 cwt. of tallow, and about 3 cwt. of rosin; the rosin to be broke in small lumps. In the first place, put into the boiler about 150 or 200 gallons of leys (about the weight of 16 oz. 4 dr. 48 gr. the English pint, which will nearly answer to NO 32 of the forementioned divisions), and set the fire; then add the tallow and rosin. This done, the pan is said to be CHARGED.

A good fire may be kept up until all is thoroughly melted, and the pan brought to boil; during which time there ought to be constant stirring with the paddle, to prevent the rosin settling to the bottom. If the goods or materials in the pan appear to

swell up, damp the fire, which is done by opening the furnace door, and throwing ashes thereon (some have proper dampers), when the whole will boil at leisure. As the caustic alkali immediately grips to the tallow, there is no occasion for long boiling; about two or three hours will be long enough: the fire may then be drawn, and the pan allowed to stand for four or six hours, when the weak leys may be pumped off, and fresh ones added for second boil. It may be necessary to mention, that when the pan is wished to be cranned, or pumped off sooner, a few pails of cold ley must be thrown in, a little after the fire is drawn.

Set the fire again for second boil, and when properly a-boil, two or three hours may be sufficient at any one time to continue the boil: the strength of the leys are often gone before that period arrives. A

short experience, however, with attention, will perfectly inform any sagacious person with regard to this particular.

The boilings to be thus continued day after day, until the soap becomes thick, and of a strong consistence. Take then a little upon the forefinger, and after letting it cool a few seconds, press it with the thumb. If it squeezes into a thin, hard scale, the soap is fit, or ready, for finishing: if otherwise it appear greasy, and stick to the finger, and of a soft consistence, more leys must be added, and if that does not harden it, another boil must be given. But, in consequence of the former scaly-like appearance, give the pan a good hearty boil, and draw the fire. Cool down with two or three pails of leys, and in about two hours thereafter pump off the leys; which should be done at all times as clean as possible. This done, put in six or eight pails of water to the

boiler (no leys at finishing being used), set a brisk fire, and keep constantly stirring with hand-stirrer and paddle alternately, until all is melted, and begin to shew an appearance something like thin honey. Take now a little from a boiling part, upon the hand-board, and observe, when held up, if any leys run clearly from it : if they do, more water must be put in, and the boil continued. When, upon the other hand, no leys run from the soap when held up slanting-ways upon the board ; in that case, too much water have already been given. A little strong salt ley must now be added to open it, technically termed *cutting up* ; or, instead of salt ley, a little strong common salt and water ; about half a pailful may do. I should prefer this last to the ley, wishing now to exclude as much as possible all alkali from entering the pan. We come now to the most critical part of boiling, that is, the grand criterion ob-

served in finishing soap : and it ought to be particularly attended to, that the soap be brought to that state, so as, when held up upon the hand-board, the leys do not *run* down from the soap, but are seen, as it were, just *starting* from it. The fire may then be drawn away, and the soap declared finished : or, if palm-oil is wished for making it of a beautiful colour, about 20 lib. may be put into the boiler, after you discover, as above, the soap to be finished ; and in about half an hour after the oil is put in, the fire may be drawn, and the whole allowed to stand for 48 hours, when it may be cast into the frames.

In about three days (supposing the frames 30 inches deep), the whole will cut up into bars.

A Charge for pure White Soap.

✓ The boiler being made perfectly clean, put in 10 cwt. of best home melted tallow (no rosin is used in white soap), with 200 gallons leys, NO 22; melt down with a moderate fire, as the goods now in hand are something similar to milk, exceeding apt to boil over.

Close attention, therefore, is absolutely needful upon this first boil; which may be continued about two hours, with a moderate fire, when it may be drawn away, and the pan allowed to settle about two hours, when the leys may be drawn off. The process to be observed in this soap is exactly similar to the last operation. Two or three boils a-day to white soap may be given with great ease; the leys sooner subsiding in the

boiler than with yellow soap, and can be cleaner pumped off.

When sufficient boils have been given, and the soap arrived at perfection, it will assume an appearance something like a curdy mass. Take then a little upon your forefinger, (as before directed) ; and if the same effect seems to attend it, that is, when pressed with the thumb it squeezes into a thin, hard, clear scale, and parts freely with the finger, the soap is ready for finishing. Draw the fire cool down with a few pails of ley, and in a short time thereafter pump clean off.

Set the fire, and add to the soap eight or ten pails of water, (the pail I suppose to contain about nine or ten English gallons). When this is melted, and properly incorporated with the soap, try, as formerly directed, if the leys run from it when held up upon the hand-board. If they do, more

water must be put in. If they do not run, or any appearance of them, continue boiling for a short while longer, and then add a pail of salt and water pretty strong, mixed together; about one-third salt, and two-thirds water. This will have the effect to cut up the pan, or separate the soap and water completely from one another. When this is apparent, draw the fire; let it stand for half an hour, when the water will pump off, bringing therewith most of the remaining alkaline leys of the former boil.

This I call the first washing; and if kelp-ley has been used in the operation, the propriety of this must be conspicuous, for the water pumped off will be of an exceeding dark bottle green colour. The finishing of white soap without this precaution, is the sole cause of that blueness so frequently observed in that article when made and brought to market.

The blue ley being pumped clean off, set again the fire, and put into the boiler six or eight pails of water; and when thoroughly incorporated and boiled some time, try if the water runs from the soap: if it does, add water in small quantities at a time, until it is observed not to run, but, as formerly mentioned for yellow soap, to appear as just starting from the soap; in that case, after giving a good boil, and swelling the soap up in the pan to near the brim, draw away all the fire, and spread it about to die away. The pan is now finished, and may stand about twelve or fourteen hours; and if the quantity is large, that is, two, three, or four ton, double this time to stand will be much in favour of the soap, providing always that it can be kept very close and warm in the boiler. If any blueness still appear, repeat the washing.

Before casting, I would recommend the

umes to have a bottom and lining of coarse cloth, for white soap only. After all is cast into the frames, let it be well stirred, or crutched; and it is very proper that it also be covered close up with old sheets, bass mats, &c. upon the top of the frame and soap, and allowed to cool gradually, and all together.

In about three or four days (supposing, as formerly, the dip 30 inches), the coverings and frames may be taken off, and the whole cut up into such size of bars as may best suit the customers.

Having in the foregoing pages endeavoured to give a clear and distinct illustration of the proceedings necessarily attending the manufacturing of yellow and white soap, I have only to add, that frequent trials, and diligent observation, can alone direct to further improvement.

We come next to explain how this white soap, at a moderate expence, may be perfumed or scented, in order to make it appear in the character of what is generally denominated *Windsor Soap*.

This perfume must be prepared by the manufacturer himself; for to purchase it from perfumers would be attended with too enormous an expence. I have acquired this perfume in the following manner, viz. Procure a small still, about 20 English gallons, with a proportionate worm of six or eight turns, the placing of which properly any mason can instruct. Put into the still about 14 or 16 lbs. of good fresh caraway seeds, and fill up with water about two-thirds full: let the head and body of the still be luted together, as also the pipe where it enters the worm. Set a pretty brisk fire, and as the still boils, the essential oil will run off, which may be received

into bottles, having a filler in the mouth. When all the oil seems to appearance to be extracted, the operation is finished, and nothing remains but to separate the oil from the water that has accompanied it. This must be accomplished by a separating-glass, or, if that cannot be had, prepare a few worsted threads ; put one end of them into the bottle having the essential oil and water in it, and the other ends into an empty bottle along side : by this means, the whole of the essential oil will make its escape from the bottle of oil and water, by ascending the worsted threads, and drop into the empty bottle.

The oil being prepared and collected, we now proceed to get it ready for introducing into the soap. In its present state it is not fit, but must be, according to the common term, *killed*, or deprived of its oily nature. This is accomplished by mixing it with a

small quantity of spirit of wine, or alcohol stirring them together until the oil is observed to lose its oily quality, and to become, as it were, one body with the mixing spirit. The proper time for incorporating this perfume with the soap, is during the casting into the frames, and should be put in at two or three different periods. When all is in, finish as formerly directed, by stirring and covering close up.

This essential oil of caraway is esteemed an exceeding strong perfume, asserted by some chemists to be about twenty times stronger than anise-seed. As a proof of the amazing volatility of this perfume, the distiller will find some difficulty, for several days after the operation, to wash himself clear of the scent, even suppose he strip to the skin, and change every article of dress. The quantity, therefore, to be used by the soap-maker, for his certain purpose,

must be left to his own experience and discretion, to correspond with the quantity of soap intended to be perfumed.



Having in the preceding pages exhibited a clear and comprehensive view of the whole proceedings attending the charging, boiling, and finishing of *yellow, white, and perfumed, soap*, I shall endeavour, in the *next* place, to present the reader with an account of the making of a different quality of soap, and shew, by a few specimens from real operations, the method, materials, and proportions, used in the manufacturing of *black, green, or soft, soap*.

The peculiar method pursued in making this soap, differs considerably from that of hard soap. The hard has the whole leys extracted totally before finishing : Soft

soap, on the contrary, retains the whole leys used in the making thereof; becoming, with the other materials employed, one compound body, called, *soft soap*. A few examples will clearly explain the nature and practical means made use of in producing this very useful soap.

The fundamental principle upon which the proper management, or manufacturing, of soft soap depends, as we have before stated for hard soap, is a certain knowledge of the quality and strength of the leys; for however necessary that knowledge may be in hard soap-making, it is peculiarly more so in soft.

The using of leys below the proper strength allotted, will materially spoil the whole boiling, and occasion much additional trouble to the manufacturer, with a considerable loss of time, before a proper arrangement afterwards can be effected, and

things again put to rights. To avoid any inconveniencies of that nature, the workman must be very particular in ascertaining the exact strength of his boiling ley. When English ashes are used, the strength of a boiling ley (according to the former calculation), is, $\frac{18}{128}$; when foreign ashes, $\frac{22}{128}$ parts, or, as they are commonly designed, *carats*. We shall here set down the former calculation of the different degrees of strength of the leys, for the greater convenience of the operator, in the form of a table.

128 parts, or 4 ounces.

$\frac{64}{128}$ ditto - 2 ounces—1st division.

$\frac{32}{128}$ ditto - 1 ounce—2d division.

$\frac{16}{128}$ ditto - 8 drams—3d division.

$\frac{8}{128}$ ditto - 4 drams—4th division.

$\frac{4}{128}$ ditto - 2 drams—5th division.

$\frac{2}{128}$ ditto - 1 dram—6th division.

$\frac{1}{128}$ ditto - half a dram—7th division.

After the proper weights for each of the divisions are got ready, it will be easy to pick out such as may serve for the weight of any ley : For instance, NO 16 and NO 2, is 18 carats ; or, 16, 4, and 2, is 22 carats ; the boiling ley for English and foreign ashes.

The weights and measures which I have had occasion to mention, in the course of the preceding pages, are those used in the dispensaries, viz.

Wine Measure.

A gallon	} contains	{ Eight pints.
The pint		{ Sixteen ounces.
The ounce		{ Eight drams.

The pound	} contains	{ Twelve ounces.
The ounce		{ Eight drams.
The dram		{ Three scruples.
The scruple		{ Twenty grains.

oz. dr. gr.

The weight of an English pint

measure of strong soap-ley is, .	17	6	24
Distilled water,	15	1	50
Rain water,	15	2	40
Spring ditto,	15	3	12
Sea ditto,	15	5	20
Oil of vitriol,	28	5	20
A good boiling ley,	16	4	48

*Soap Frame, 45 Inches long, by 15 Inches
broad, Inside.*

DIP.	HOT AREA, 24.10.					DIP.	COLD AREA, 24.87.				
Inch	L.	s.	d.	qrs.	pts.	Inch	L.	s.	d.	qrs.	pts.
1	0	4	0	3	.21	1	0	4	2	1	.447
2	0	8	1	2	.42	2	0	8	4	2	.894
3	0	12	2	1	.63	3	0	12	7	0	.341
4	0	16	3	0	.84	4	0	16	9	1	.788
5	1	0	4	0	.05	5	1	0	11	3	.235
6	1	4	4	3	.26	6	1	5	2	0	.682
7	1	8	5	2	.47	7	1	9	4	2	.129
8	1	12	6	1	.68	8	1	13	6	3	.576
9	1	16	7	0	.89	9	1	17	9	1	.023
10	2	0	8	0	.10	10	2	1	11	2	.470
20	4	1	4	0	.20	20	4	3	11	0	.940
30	6	2	0	0	.30	30	6	5	10	3	.410
40	8	2	8	0	.40	40	8	7	10	1	.880
50	10	3	4	0	.50	50	10	9	10	0	.350
100	20	6	8	1	.00	100	20	19	8	0	.700

Examples.

Suppose 5 inches dip, by hot area.

24.1 area.

5 inches.

120.5

Discount one-tenth 120.5

108.45 neat lbs. wt.

Duty - 2.25 or $2\frac{1}{4}$ d. *per lib.*

54225

21690

21690

12)244.0125

4

s. d.

20 4.05,00, or,

L. 1:0:4:0.05. See Table.

Example.

Suppose 5 inches dip, by cold area.

24.87 area.

5 inches.

12435

Discount one-tenth 12435

111.915 neat libs. wt.

Duty - 2.25 or $2\frac{1}{4}$ d. *per lib.*

559575

223830

223830

12)251.80875

4

s. d. -----

20 11 3.23500, or,

L. 1:0:11:3 .235. See Table.

In casting the dip of a soap frame, both areas are used by the Exciseman. For instance, suppose 5 inches of warm soap be allowed to cool in the frame, it may be discovered to have decreased 3, 4, or 5-10ths; consequently, the soap must be cast up by the hot area for the five inches of original dip, and by the cold area for the real dip after cooling, say 4 inches 7-10ths, or 4, 6, or 4, 5, &c.; and whichever of these dips turn out highest, the trader is charged with for duty.

It might be equally correct, and full more convenient and expeditious, to use, for the weighing, or ascertaining the strength of the leys, a glass hydrometer, marked inside of the tube with figures. These can be had from any weatherglass-maker. This hydrometer may easily be adjusted to all the divisions in the foregoing table, as also to rain, river, and distilled water, sea water, &c.

To use the above hydrometer, a glass or crystal cylender will be wanted, the depth of which ought to be fully the length of the hydrometer, and of a diameter sufficiently large to admit the same freely.

When the leys are to be tried, fill the cylender, and introduce therein the hydrometer: it will then be seen which division, or number, the hydrometer sinks to; consequently must exactly ascertain, without farther trouble, the strength of such leys.

A proper boiling ley for soft soap, ought to weigh about 10 or 11 drams, which makes a very good medium. Seven pounds ten ounces tallow, avoirdupois weight, is supposed equal to a wine gallon nearly; and pump water, the English gallon, should weigh about 8 lib. 2 oz. 10 dr. avoirdupois weight.

Upon these principles, we establish the proper standard weight for English leys to

be (agreeable to the Table), $1\frac{1}{2}\frac{8}{8}$ parts, or, as they are generally termed, *carats*, and for foreign ashes' lees, $1\frac{1}{2}\frac{2}{8}$, or 22 carats. We shall now commence an operation with a charge for what is called

FIRST CROWN SOFT SOAP, 18 BARRELS.

The quantity of leys requisite for completion of this charge, will be about 400 gallons, the weight of which to be about $11\frac{1}{2}$ drams; about one-third of which must be put into the boiler previous to any of the other materials: afterwards add, 2 cwt. 2 qrs. tallow, 2 cwt. 2 qrs. hogs-lard, and 70 gallons olive oil. The leys herein to be used, are supposed to be from Hungarian and English (Essex) ashes. The proportion is, one of the English to eight of the Hungarian. The particular mode of proceed-

ing is thus : After the leys are put in, add the tallow, and light the fire. When all the tallow is melted, put in the oil, and draw the fire a little afterwards, and allow the pan to stand about two hours. Light again the fire, and add about 20 gallons more of the leys. After the pan begins to boil, add now and then a little more leys, to the purpose of preventing the soap from boiling over : and this adding of lees to be continued until the soap is supposed to be about half boiled ; when it will be time to try, whether the soap has got too much, or too little leys.

This trial is called *proving*, and is necessary to be done several times during the operation, and previous to the finishing. The method of performing it is this : Provide a piece of glazed Dutch delft, and also a clear clean knife : with the knife take

up a piece of the soap from the pan, and if it turn whitish thereon, and falls from it in short pieces upon the delft, it is then concluded too much leys have been put in; to rectify which, a little more oil must be added. On the contrary, if the soap wants leys, it will fall from the knife in long, ropy-like pieces; in consequence whereof, add some more ley. When, however, it happens to be brought to perfection, neither wanting more leys nor oil, but just in a right state; it will then be observed, that when taken upon the knife, to stand the proper colour, not ropy, nor too white, but transparent. The fire may now be drawn, the soap being properly finished, and ought immediately to be cast into the barrels, firkins, &c.

Remember always, that after the second time the fire is lighted, to keep the soap

boiling briskly, till the pan is nearly ready, when it ought to boil slow, until finishing, and ready to cast.

We have now gone through, and finished, the first pan. The second shall be an actual operation, noting the time spent thereon, and quantity of soap produced.

SECOND CHARGE FOR FIRST CROWN SOFT SOAP.

The materials to be used for this purpose are the following :

224 lbs. tallow,

166 lbs. hogs-lard,

55 gallons rape-seed, or olive oil,

180 gallons leys, weight $11\frac{1}{2}$ drams, from pearl ashes.

The Process. In the first place, put into the boiler 140 gallons of leys, with the tallow; set the fire, and when the tallow is all melted, put in the oil, and draw the fire. Let all stand for two hours, when the fire may again be lighted, and immediately 20 gallons of leys put in: the other 20 gallons was added at different times, as before directed, in the course of the boiling. This boiling commenced at M. past 8, and was finished at E. past 7, and produced 33 firkins of good soap.

A CHARGE FOR SECOND CROWN SOFT SOAP.

280 lbs. tallow,

140 gallons leys, weight 11½ drams,

82 gallons whale oil.

Put in 100 gallons of leys, with the tallow, and light the fire. When the tallow is melted, add the oil, and draw the fire. Let all stand for two hours. Again light the fire, and add 20 gallons of leys. With this the boiling is continued until the soap is about half finished, when 10 gallons more leys is added. During the remainder of the boiling, add, at different periods, the other 10 gallons leys, which will completely finish the soap.

A CHARGE FOR BEST COMMON SOFT SOAP,
with Old Soap returned.

254 lib. tallow,
85 gallons train oil,
200 gallons leys, weight 11 drams, blue
pearl ashes.

At M. 6, charged with 140 gallons leys, and all the tallow, with 239 lib. of old soap. Set the fire. At 8, the oil put in, and fire drawn. At 10, the fire again lighted, and 40 gallons of leys added. From this time till E. 2, at different times, add about 15 gallons leys. From this to 5, add at different periods, 5 gallons. At 6, the fire may be drawn, and shortly thereafter the soap may be cast into the firkins.

From these examples, founded upon real operations, the making of soap may be performed by any person, although never before acquainted with the business; at the same time it may be proper to inform such, of the necessity there is, on their part, of strict attention during the operation: the person ought continually to be poring into

the pan, every boil should particularly be observed, and the difference noted between the boil when the soap is right, and when it is wrong; how it boils when half made, when three-fourths made, and in an especial manner at the finishing. These observations made with precaution, will, with a short practice, render the operation familiar, and the workman complete master of his trade.

We shall add a few more general observations, necessary to be well studied, and rendered familiar to the operator.

To know when the soap wants, or has got too much leys, observe the following directions. Take about the size of a pigeon-egg of the soap, while hot, and put it upon the delft. Observe if whitish streaks and specks plainly appear, and continues so after the soap grows pretty cold. When this happens, the soap has got enough of

leys. If these appearances are not evident, in that event, the soap must have more leys. Or, to know if the soap have got enough of leys, dip the blade of the knife into the soap ; and when coldish, stroak the soap off the knife upon your forefinger ; observe if any streaks appear in the soap : if any, then the soap is plentifully supplied with leys ; but if none, more leys must be added. It is always a good sign that soft soap is enough boiled, when, upon trial as above, with the soap on the finger, that it stands up, and appears with a thin roundish back ; and when right, it will appear upon the finger of a grayish colour at the top of the outer edge.

When different leys are used, that is, some strong, and others weak, particular attention must be paid to the proportioning the one with the other, or, the weak with the strong, in order that a proper strength,

or boiling ley, be had from the composition. If too weak leys are used, there is a danger incurred of spoiling the whole soap, which is hardly to be righted again.

To guard against this great evil, observe the following rule: Suppose there is three leys of different qualities to be boiled with, two of them is over weak, one is too strong; try their strength mixed together, thus:

	<i>drams.</i>	<i>drams.</i>
3 pails, or couls, at 16 each, is	48	
3 ditto, ditto, at 10 ditto, is	30	
3 ditto, ditto, at 8 ditto, is	24	
9		102

9)102($11\frac{2}{3}$, or $\frac{2}{3}$, the standard for boiling ley.

$$\begin{array}{r}
 9 \\
 \hline
 12 \\
 9 \\
 \hline
 3
 \end{array}$$

We now find, that an equal proportion of these leys mixed together, produce, upon an average, a medium weight, equal to the standard for proper boiling lee. Weak leys take always a larger quantity, and much longer boiling. On the other hand, strong leys take a less quantity to do the same work, and considerable less boiling; consequently, in using a proper ley, both time and fuel is saved.

That soap-boiling is so bad and unprofitable a trade, as many represent it, I cannot see. Such ought always to give some reason for their assertion. If that was the case, it is strongly impressed upon my mind, that the ignorance of the principles of soap-making, will be found to be the sole cause of numbers failing, that have imprudently entered into an unknown, and, consequently, critical and unprofitable manufactory.

I shall here give an experiment, made with great precision, to ascertain with regard to the expence attending the making of white soap. The only materials used, of the alkali kind, was the second sort of American pot-ash, but of a quality very superior to what commonly is sold under that denomination.

I broke down pretty small a quarter cwt. of the above American pot ; and, with a proportionate quantity of good lime-shells, mixed therewith, set them in a small yetlin cave. I added water just sufficient to saturate the mixture. In this state, having stood for about 12 or 14 hours, I let it run, and drew off 4 English gallons of ley, which I ascertained, by my hydrometer, to be $14\frac{1}{2}$ strong. I filled up my cave with water, and continued the running slowly until I had 28 gallons more, of strength by hydrometer 18 strong. I then stopped up

my cave from running, and proceeded to calculate the value of my ley, as follows :

In the first place, I find that 1-4th cwt. of American pot, at 55s. *per* cwt. (their real price at the time) is 13s. 9d. which must be the value also of my 32 gallons of leys, drawn from the ashes. At that rate, the English pint is worth about two farthings and one half farthing. I now proceeded further to complete my experiment, and satisfy myself at what expence white soap could be made. For this purpose, I charged a small boiler, which holds about $1\frac{1}{2}$ gallons, with 4 libs. of good rhinded tallow, and with 10 pints of the ley of the weaker sort, or second running, which had been kept separate. The pan boiled very close, that is, the leys and tallow became one mass of seemingly thin soap, without any appearance of separation betwixt the leys

and tallow. In this state of the pan, I was obliged to add a little salt and water, which brought about a separation in a short time. I then let my pan stand off the fire for half an hour, when the weak leys cranned freely off. I now added 6 pints of same leys, for second boil. This had the effect totally to kill the tallow, and bring the soap to a pretty strong consistence, and the leys cranned off without salt in half an hour. I then prepared for third boil, by adding 7 pints more of same leys, 18 strong, and boiled half an hour. The soap appeared now strong, but rather close; and this closeness I attributed to too much salt; to rectify which, I added between one and two pints of water. This, in a short time, had the effect to bring on a separation. The pan was taken off the fire, and allowed to stand about an hour and a half, when it parted freely with all the leys. Nothing remained

now to be done but finishing, which I completed with between 3 and 4 pints of water (some salt also was used), in the course of an hour and quarter. The pan was now taken off the fire, and allowed to cool for 24 hours, when I found, upon weighing, I had $10\frac{1}{2}$ lbs. of good white soap. Upon looking over my jottings, taken during the operation, I found that there had been used about 23 pints of leys, and about 3 lbs. of salt.

The expence of the whole will be evident, by the following correct statement viz.

L. s. d.

To tallow, 4 lbs. at $7\frac{1}{2}$ d. *per* lib. . 0 2 6,, Leys, 23 pints, at $2\frac{1}{2}$ farthings*per* pint, 0 1 $2\frac{1}{4}$,, Salt, 3 lbs. at $\frac{1}{2}$ d. *per* lib. . . . 0 0 $1\frac{1}{2}$,, Duty charged on $10\frac{1}{2}$ lib. soap,at $2\frac{1}{4}$ d. *per* lib.—say 0 1 9,, Fire, &c. about 0 0 $2\frac{1}{4}$

Total expence, . . L. 0 5 9By $10\frac{1}{2}$ lbs. soap, at 9d. *per* lib.

(white soap was at that time

selling in the shops at 10d.) . . 0 7 $10\frac{1}{2}$

Neat profit, . . . L. 0 2 $1\frac{1}{2}$

It seems now very plain, that if 23 pints of leys, as above, produce of neat profit 2s. 1½d.; that 256 pints, the whole produce of the quarter hundred of ashes, will be 23s. 2¼d. or at the rate of L. 4, 12s. 9d. per cwt.; and as more of the weak leys were still to run, the profit, of course, must have been something more. I proceeded in this experiment no further with the remainder of the leys, which must, if used, have also necessarily been productive, as above mentioned, of more profit. Upon the whole, I find by calculation, that the cwt. of soap, including materials, duty, fire, &c. will cost the manufacturer L. 3, 1s. 4d., or L. 61, 6s. 8d. per tun of 20 cwt. for white soap, which will appear evident by the following statement :

lib. soap s. d. lib.
 If $10\frac{1}{2}$ cost 5 9, what will 112 cost?
 2 12 2

21 69 224 half lbs.

69

2016

1344

21)15456(736(12)

147

61s. 4d. Or,

75

63

126

126

...

L. 3 : 1 : 4 *per* cwt. Or,

61 : 6 : 8 *per* ton.

L. s. d.

One ton soap, at 9d. *per* lib. comes

to 84 0 0

Deduct expences . . . 61 6 8

Neat profit . . . L. 22 13 4

It will be proper to observe, that the above experiment was made with the best home melted tallow. If foreign tallow, according to the general run of such, had been used, the produce would have been far from being so beneficially productive. However, a much smaller profit would be convincing, that the trade was not that losing one, which many ignorant and unfortunate adventurers have taught us, from their experience, to imagine.

Another experiment with the same quantity of tallow (4 lib.), but foreign, and above six years old, was tried with Petersburg pearl ash-ley. The operation was completed at three boils, and there was used 14 English pints of the ley; and the produce of the soap turned out to be seven and one half pounds.

The calculation may stand thus, viz.

	<i>L.</i>	<i>s.</i>	<i>d.</i>
To 4 lib. tallow, at 7d. <i>per</i> lib. . .	0	2	4
„ 14 pints ley, at $2\frac{1}{2}$ farthings			
<i>per</i> pint	0	0	$8\frac{3}{4}$
„ 2 lib. salt	0	0	1
Duty on $7\frac{1}{2}$ lib. soap, at $2\frac{1}{4}$ d. <i>per</i>			
lib.—10 <i>per cent.</i> off	0	1	4
Fire, about	0	0	2
	L. 0	4	$7\frac{3}{4}$
$7\frac{1}{2}$ lib. soap, at 9d. <i>per</i> lib.	0	5	$7\frac{1}{2}$
	L. 0	0	$11\frac{3}{4}$

The neat profit here may be called one shilling.

Upon a calculation of working even with these coarse and improper materials, judiciously managed, there is an evident gain of above 10s. 6d. *per* cwt. or L. 10 : 10s. *per* ton.



As mistakes by Excise-officers are not at all improbable, in casting up gauges of soap, it is proper that every soap-maker should cast up his own, after the dip of the frame is ascertained by the officer, supervisor, &c. And as many of the trade may not be acquainted with the precise mode of doing so, a specimen of the work may be acceptable, and proper here to be added. For that purpose, it may be supposed that the dip of the soap in the frame, as taken by the officer, is 30 inches and 9-10ths. The areas, by which the Excise-officers make their calculations, are established by law to be 24 lib. and 1-10th of a lib. upon every inch of the dip of the frame. This is called the *hot dip*, and will generally carry the gauge, providing no cold dip is got, or that

be less. The area for the cold dip is 24.87.
The Excise always takes the highest amount.

Example of the above supposed Dip.

$$\begin{array}{r}
 30.9 \\
 24.1 \\
 \hline
 30.9 \\
 1236 \\
 618 \\
 \hline
 744.69 \\
 74469 \\
 \hline
 670.221 \\
 2.\frac{1}{4} \\
 \hline
 1340 \\
 167\frac{3}{4} \text{ qrs. rem.} \\
 \hline
 12)1507 \\
 \hline
 20)125 : 7 \text{ d. rem.}
 \end{array}$$

L. 6:5:7 $\frac{3}{4}$ d. the neat duty for 30 inches
9-10ths, exclusive of the
fraction.

And for working by the Cold Area, see p. 73.

Section 1. The Board of Directors of the
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APPENDIX.

NO I.

SHORT DISSERTATION

ON

SPOILED HARD SOAP.

IN the preceding pages, we have supposed every thing to go right, with regard to the manufacturing of the different soaps. It may be proper, however, to mention, that a boiling of hard soap sometimes may mis-give, or go wrong. It is then said to be a

spoiled pan. In this state, much trouble and expence, to an inexperienced boiler, is the consequence, before such soap can again be brought right. By attending, however, to the rules already laid down, circumstances such as this will seldom happen. For the benefit and instruction of the reader, a case of the kind which once occurred to the certain knowledge of the author, may here be inserted, together with its unfortunate issue.

Indeed, instances of what are called *spoiled pans* of soap, or, soap, from inexperience, in the course of making, converted into an uncommon mass, so as to baffle the utmost skill of the manufacturer to redeem, or set to rights again, have frequently happened ; though, with the experienced and well-informed soap-maker, such disastrous failures will seldom or never occur, the causes to him being evident. To illustrate these

observations, the circumstances of the case alluded to are the following, viz.

One evening, accidentally meeting with an intimate acquaintance belonging to the Excise, he mentioned, that one of his traders (in the soap line) had been working with a pan of soap these three or four weeks, and had brought it into such a state that he seemed completely bewildered, and unable further to proceed. He begged I would step along with him, take a look at it, and give the poor man my advice, so as to help him on, if possible. This man's pecuniary circumstances were such, that, as represented by my friend, the failure of this pan of soap would ultimately work his ruin. Sympathy, therefore, for the poor man, induced me to comply with this request, and take a look of the soap in the boiler : but such a sight, in fact, I never

before witnessed. I found the pan almost brimful ; and, upon dipping in my finger, and applying it to the tongue, I discovered the pan to be completely choked or poisoned with salt. On inquiry I learned, that he had expended more materials upon this single pan of soap, than, with proper management, might have completed three such boilings. Leys had been added in their mild state, which always have the tendency to run the materials into a kind of entire mass, and preventing the possibility of extracting the leys therefrom, the whole being converted into a kind of thin soap. In this state of a soap pan, it is usual to add some common salt, to facilitate the separation of the leys from the other materials, which generally has that effect, (provided the leys boiled with were weak caustic ley): But, if the leys were mild, the fixed air not having been properly extracted,

the common salt, in that case, fails of the desired effect, and rather confirms the disorder. This man had added salt in abundance, then strong mild ley, then salt again, and more strong ley, until his boiler was so filled, that want of room only prevented him from putting in more. He told me, he thought a fresh cave of strong ley would be necessary to cut her up. My opinion to him, was, that too much of that had already been applied; but that, if he would submit to my advice, I thought his pan, in a day or two, might be again brought to rights. What is to be done, then? says he. In the first place, I told him to put in immediately two or three pails of water. This surprised him much; and with a kind of seeming reluctance, consented that I should have my own way. As there was but little room in the pan for boiling, a very gentle fire could only be kept up. This, however, had the

wished-for effect, of opening the pan, or causing a small separation of the leys in a short time, which was all that could at present be done. I intended next day to have drawn off as much of this salt ley as possible ; consequently, procure a little more room to work in ; and afterwards, by adding more water, the salt leys would by degrees be perfectly extracted, the pan sweetened, and brought into a fit trim for finishing. When I observed the above appearance of opening, I left him, with instructions to keep a slow fire for about an hour or so longer, when it might be drawn away ; and to-morrow morning I should call, and inform him what further was to be done. Instead, however, of paying proper attention to my directions, which was, to avoid using any more ley, he, as soon as my back was turned, prepared more strong mild leys, and put them into the boiler ; by

which the soap was set back to its original close state. Upon my being informed of a conduct so preposterous and stupid, I declined my intended visit next morning, and allowed this infatuated man to exercise the freedom of his own will. The consequence was, that the pan never afterwards could, by any expedient he possibly might contrive, be again brought to rights; he at last gave it up; and the spoiled stuff was, with his utensils, &c. afterwards sold by the Excise for arrears.

The unfortunate issue of this pan of soap, plainly demonstrates the serious effects of inexperience and ignorance in the knowledge of the original materials. For had this man allowed the salt leys to have been washed off his soap, and then given a boil of a weak caustic ley, his soap might have been finished with propriety, and turned

out well. The extracted salt leys, by being run through a lime cave, might have been converted into a good caustic ley, and used over again with advantage.

Soap-makers will do well to consider this case with attention. By so doing, disagreeable circumstances of a similar nature may be avoided ; and, consequently, much time, expences, and an infinite quantity of trouble, saved. No soap-ley at any time ought to be used, but such as, by experiment, is proved to be a caustic ley, entirely freed from its fixed air. And it is with much satisfaction we present the reader, in the following Number, with the experiments of an able and justly celebrated chemist, made expressly with the view of ascertaining this important and fundamental requisite in soap-making, and therefore can with confidence be recommended to the practice of the manufacturer.

NO II.

PREPARATION for a SOAP-LEY.

By Dr. Joseph Black, Professor of Chemistry in the University of Edinburgh.—

(Referred to, p. 45. of this Work.)

THE celebrated Dr. Joseph Black, professor of chemistry in the University of Edinburgh, in an experiment made with a view to investigate the nature and properties of the caustic alkali, proceeds thus * :

“ I made a caustic or soap-ley in the following manner :

* See his Experiments upon Magnesia Alba, Quicklime, and other Alkaline Substances.

“ Twenty-six ounces of very strong quick-lime, made of chalk, were slaked, or reduced to a sort of fluid paste, with eleven pounds of boiling water, and then mixed in a glass vessel with eighteen ounces of a pure fixed alkaline salt, which had been first dissolved in $2\frac{1}{2}$ lbs of water. This mixture was shaken frequently for two hours, when the action of the lime upon the alkali was supposed to be over, and nothing remained but to separate them again from one another. I therefore added 12 lbs. of water, stirred up the lime, and, after allowing it to settle again, poured off as much of the clear ley as possible.”

Another method of the same professor is, One part of a pure fixed alkaline salt to three parts of common limestone, fresh slaked and sifted, for a common or ordinary soap-ley. He then proceeds thus:

“ The lime and alkali were mixed together, under the form of a very thick milky liquor, or fluid paste ; because they are thus kept in perpetual contact and equal mixture, until they have acted sufficiently upon one another : whereas, in the common way, of using a larger quantity of water, the lime lies for the most part at bottom ; and, though stirred up ever so often, cannot exert its influence so fully upon the alkali, which is uniformly diffused through every part of the liquor.

“ The above ley was found, upon trial, to be saturated by acids, without the least effervescence, or diminution of weight.”

The author, in the preceding parts of this treatise, has endeavoured to furnish the attentive reader with, what he trusts, an accurate and comprehensive idea, both of the materials proper for, and the process necessary to, the successful manufacturing of Hard and Soft Soap. One necessary piece of knowledge, however, to every soap-maker, and intimately connected with the present work, still remains to be taken notice of, viz. *The Revenue Laws*, by which every soap manufactory must be strictly regulated. The want of such knowledge might frequently hazard mistakes, and ultimately incur penalties altogether undeserved. To guard him, therefore, against such serious consequences, the utility of annexing to this

work a view of the principal of these laws, peculiar to hard and soft soap-makers, must appear highly proper : and moreover, it is also presumed, will be singularly acceptable to such traders as may not formerly have had an opportunity of supplying themselves with the statutes thereanent made and provided ; and, by being concisely collected and brought under immediate review, every person interested may upon all occasions have it in his power to refer with greater facility and ease than to the printed detached acts themselves. What follows, therefore, are abstracts of these statutes, chiefly taken from an *Abridgment of the Excise Laws*. But as the act 24th Geo. III. *for the better securing the duties on soap*, is amongst the last general statutes upon the subject, containing much useful information to the soap-maker, and the more worthy of his attention, as comprehending the substance of most of

the former laws with regard to the manufacturing, &c. of soap, it has therefore been thought essential to subjoin, from the act itself, the whole of the clauses of that statute, in so far only as they are particularly connected with the soap-maker. (*See sequel, p. 121.*)

NO III.

*ABSTRACT of the principal EXCISE
LAWS, peculiar to Hard and Soft
Soap-Makers.*

Allowances for Spoiled Soap, Cuttings, &c.

10th Ann, C. 19, Sect. 28. Vol. II, p. 299.

And 11th Geo. I. C. 30, Sect. 36, 37,
38. Vol. III, p. 510.

Whenever stale, or rotten soap, or cuttings,
for which the duties have been charged,
shall be, in presence of the officer, put

again into the copper or pan to be renewed, he shall make an allowance of the duty of the same, and certify every such allowance upon his report of charges to be returned : But if previous notice, in writing,—of twelve hours in the mortality-bill limits—twenty-four hours elsewhere—of the time intended for such putting thereof into any making of soap, be not given to the proper officer, he shall not certify such putting in.—A false certificate by him incurs a penalty of 10s. *per lib.* and the maker the like sum, for what quantity he claims any benefit for.



The aforesaid Allowance repealed.

5th Geo. III. Sect. 16. 20. P. 44. 53.

The aforesaid allowance, with respect to hard soap only, *repealed*; and in lieu thereof, the makers of hard soap shall be allowed, in the officer's returns or reports of the charges of hard soap made upon them, one lib. in every 10 lib. thereof, in full compensation for all waste, losses, or damages whatever: And if any hard soap (whether perfectly made or not), after being cleansed or framed, shall be put again, on any pretence, into the copper or other utensil for boiling or reworking the same, shall be again charged with the duty.



Legal Frames for Hard Soap, and also to be entered.

Act 5th Geo. III. C. 43, Sect. 19. P. 51.

No maker of hard soap shall use any other kind of vessel for cleansing, or putting his hard soap (whether perfectly made or not) into, when taken out of the copper or other utensil wherein boiled or prepared, than regular square or oblong frames only; and of each such frame, the bottom, sides, and ends, shall respectively be at least two inches thick, and the length shall not exceed 45 inches, nor the breadth 15 inches: Nor shall he use any such frame, till he give no-

tice thereof in writing at the office next to the place where such soap shall be made, nor before it be marked and numbered by direction of the surveyor or supervisor, at such maker's expence ; under the penalty of L. 20 for every such respective offence.

Legal Casks for Soft Soap.

Act 10th Ann, C. 19. Sect. 8. and C. 26.
Sect. III. V. II. P. 274. 398.

All soft soap (only), upon the making thereof, shall be put by the maker into casks of the following respective contents only, viz. barrels to contain 256 lib ; half barrels, 128 lib. ; firkins, 64 lib. ; and half firkins 32 lib. all avoirdupois, besides the weight or tare of the cask, on pain of for-

feiting L. 5 for every offence or neglect therein.

And by 12th Ann, St. 2. C. 9. Sect. 19. V. II. P. 439, To prevent the fraudulent practices of making soap in secret places, and sending it out in *small casks*; all soft soap that shall be filled in any other cask less than barrels, half-barrels, firkins, and half-firkins, shall be forfeited, and also L. 5 by the maker of it; half thereof to the seizer or informer, and half to the poor of the parish where such offence shall be committed.

*Who are not qualified to be Makers of Soap,
though making Entry.*

Notwithstanding the laws already made for securing the soap-duties, and protecting the fair trader, many gross frauds are daily practised by evil-minded and indigent persons, who make soap, and abscond before the duties can be recovered, and by other methods have evaded the duty; and having been encouraged thereto from the great length of time allowed by 10th Ann, c. 19. sect. 9. 11. (Vol. II, p. 275. 278.) for making entry of their soap, and payment of the duty, and for want of further regulations; the said recited two clauses are hereby repealed, and no person whatever shall be permitted to make

any soap,—if residing within the limits of the head Excise-office in London, unless occupying a tenement or tenements of the yearly value of at least L. 10, and for which assessed in his own name, and paying to the parish rates ; in any other part of Great Britain where there are rates to church and poor, unless assessed and paying to church and poor in the parish or place wherein residing ;—and no entry already, or hereafter made, of any soap-house, workhouse, or place for making soap, shall be of any avail to any person or persons not so qualified, or for longer time than so qualified : And every person making soap, and not so qualified, shall, notwithstanding any entry by him or them made, be deemed and taken to be persons making soap without entry, and shall be subject to the like penalties and forfeitures, by the former statutes, as persons making soap without entry.



For better securing the Duties on Soap.

Act 24th Geo. III. Sect. 7th—14th, inclusive.

And whereas, notwithstanding the laws now in force for securing the duties on soap, many frauds are still frequently practised, to the great loss of the revenue, and to the injury of the fair trader, and some better regulations in the manner of carrying on the soap-making business are still wanting; for remedy thereof, be it enacted, by the authority aforesaid, That from and after the 20th day of September 1784, all and every the officers of Excise shall at all times, by day or by night, and without waiting for

the presence of a constable or peace-officer, be permitted, upon his or their request, to enter into the house, boiling-house, warehouse, or other place whatsoever, belonging to or used by any maker or makers of any soap whatsoever, and, by gauging or weighing of the soap, or otherwise, as to such officer shall seem most proper and convenient, to take an account of the just quantity of the soap which shall have been made by such maker or makers of soap from time to time; and also to take an account of all materials for the making of soap, in the possession or custody of such maker or makers of soap; and all and every the officers of Excise shall be permitted to stay and remain in such house, boiling-house, warehouse, or other place, belonging to or used by such maker or makers of soap, or in any of such places, so long as such officer or officers shall think fit.

And, for the better preventing the frauds frequently committed by divers makers of soap, be it further enacted, by the authority aforesaid, That from and after the said 20th day of September 1784, no maker of soap shall have or keep any pipe or other conveyance from or to any copper or pan made use of in the boiling or making of soap, save and except one moveable pump for taking out salt or spent leys, which pump shall be taken out of such copper or pan before the copper or pan shall be locked down by the officer ; and that no maker of soap shall have any cock, or perforation, or hole, in the side or curb, or bottom or cover of his or her boiler or copper, nor shall have any part of the curb moveable, nor shall use any syphon, crane, or trinket, but shall take out all leys, soap, or other ingredients, contained in the said copper or boiler, by a pump, or by a ladle only ; on

pain that any maker of soap, having or keeping any pipe or other conveyance from or to any copper or pan made use of in the boiling or making of soap, save and except such pump as aforesaid, or having any cock, or perforation, or hole, in the side or curb, or bottom or cover, of his or her boiler or copper, or having any part of the curb moveable, or using any syphon, crane, or trinket, shall forfeit and lose, for every such offence, the sum of L. 500 : Provided always, That it shall be lawful for every maker of soap to have, in the cover of his or her copper or boiler, small holes, not exceeding one-eighth of an inch in diameter, for the steam to escape through the same.

And be it further enacted, by the authority aforesaid, That from and after the said 20th day of September 1784, the cover and furnace door, and ash-hole door of every copper, pan, or other utensil used by any

maker of hard soap for the boiling or making of soap, shall, and they are hereby required, to be securely locked, fastened, and sealed down, by the officer or officers of Excise who survey such trader, at all times, except when such copper, pan, or other utensils, shall be at work, or shall be opened for repairing the same, or for the inspection of an officer or officers of Excise ; and proper locks and keys, and all other necessary fastenings, for securing and sealing the said covers and furnace and ash-hole doors of every such copper, pan, or other utensil, shall be provided by the respective surveyors and supervisors of Excise of the respective districts or divisions in which such makers of soap shall respectively reside, at the expence of the respective makers in each division or district ; and whenever such maker of soap shall be desirous of opening such

copper, pan, or other utensil, or the furnace or ash-hole door thereof, and shall have given to the officer of Excise of the division or district twelve hours notice thereof, if such maker of soap shall reside within the limits of the chief office of Excise in London, or twenty-four hours notice thereof, if such maker of soap shall reside in any other part of Great Britain, then the officer of Excise shall attend to open such copper, pan, or other utensil, or the furnace or ash-hole door thereof; and if, by any means, art, device, or contrivance whatsoever, any person shall open any such copper, pan, or other utensil, or the furnace or ash-hole door thereof, after the same shall have been locked and secured as aforesaid, before the same shall have been unlocked and opened by the officer of Excise, or shall wilfully damage or hurt any such lock or other fast-

ening, every such person shall, for every such offence respectively, forfeit and lose the sum of L. 100.

And be it further enacted, by the authority aforesaid, That from and after the said 20th day of September 1784, if any maker or makers of soap shall obstruct or hinder any officer of Excise in the execution of the powers or authorities given to him or them by this or any other act for the ascertaining or securing the duties upon soap, the person or persons offending therein shall, for every such offence, forfeit and lose the sum of L. 50.

And for the better preventing the clandestine making of soap, without payment of the duties for the same ; be it further enacted, by the authority aforesaid, That from and after the said 20th day of September 1784, it shall be lawful for any officer or officers of Excise to take an ac-

count from time to time, as often as he or they shall think fit, by gauging, weighing, or otherwise, as to him or them shall seem most proper and convenient, of all tallow, oil, rosin, and grease of every kind, and of all materials for making soap, which any maker of soap shall at any time have in his possession ; and such maker of soap shall provide proper scales and weights, and assist the officer in weighing and taking such account, on pain of forfeiting L. 20 : And in case such officer shall find any decrease of any such materials for making soap, and shall not receive a satisfactory account thereof, such officer shall charge such maker of soap with duties for such decrease, according to the rates and proportions following, (that is to say) ;

For every fourteen hundred weight, or two hundred and ten gallons of oil, so missing, such officer shall charge any maker of

hard soap with the duties on twenty hundred weight of hard soap :

For every thirteen hundred weight of rendered tallow so missing, such officer shall charge any maker of hard soap with the duties on twenty hundred weight of such soap :

For every thirteen hundred weight and two quarters of kitchen-stuff and tallow so missing, such officer shall charge any maker of hard soap with the duties on twenty hundred weight of such soap ;

For every fourteen hundred weight of tallow, rosin, and oil, so missing, such officer shall charge any maker of yellow, brown, or rosin soap, with the duties on twenty hundred weight of such soap.

And be it further enacted, by the authority aforesaid, That every maker and makers of soap, before he, she, or they shall charge his, her, or their copper or boiler with any materials for making of soap, shall

give to the officer of the division or place where such soap is intended to be made, notice in writing of the particular time and hour when such maker of soap intends to charge his or their copper or boiler, as herein-after mentioned ; (that is to say) If such soap is intended to be made at any place within the limits of the head office of Excise in London, then such notice shall be by the space of twelve hours next before the time of charging such copper or boiler ; and if such soap is intended to be made at any other place, out of the limits aforesaid, then such notice shall be by the space of twenty-four hours next before the time of charging such copper or boiler ; on pain of forfeiting and losing the sum of L. 100 at every time when any maker of soap shall begin to charge his or her copper or boiler without first giving such notice as aforesaid : And if such maker of soap shall not begin

to charge his or her copper or boiler within the space of three hours next after the particular time or hour mentioned in such notice, then such notice shall be void; and every maker of soap who, after the expiration of the said time, shall begin to charge his or her copper or boiler, without having first given a new or other like notice as aforesaid, shall forfeit and lose the sum of L. 100.

And be it further enacted, by the authority aforesaid, That every maker of soap shall, before charging his or her copper or boiler with any materials for making of soap, weigh, in the presence of the officer, all the rosin, tallow, grease, or other materials, with which such maker of soap intends to charge his or her copper or boiler, and all such rosin, tallow, grease, or other materials, shall be put into the copper or boiler in the presence of the officer; and

in case the quantity of hard soap, afterwards produced therefrom, shall be found by the gauge in the frames to be less than ought to have been produced according to the rates and proportions herein before mentioned, then the deficiency therein shall be charged with the duties thereupon, according to the rates and proportions herein before mentioned: Provided always, That if any maker of soap shall have charged the copper or boiler with rough fat or rough kitchen grease, then eight pounds of rough fat shall be deemed equal to seven pounds of tallow, and five pounds of rough kitchen grease shall be deemed equal to four pounds of clean kitchen grease.

And be it further enacted, by the authority aforesaid, That no maker or makers of hard soap shall, after the 20th day of September 1784, sell any hard soap but in the shape or form of cakes or bars, or what

is commonly called or known by the name of *ball-soap*; and that all scraps and parings of hard soap shall be returned into the copper or boiler, in the presence of the officer, immediately after the soap that has been put into the frames from any one boiling shall have been cut up for sale; on pain that every maker of hard soap, selling any such hard soap in any other form than as aforesaid, or not returning all scraps or parings of hard soap into the copper or boiler, in the presence of the officer, immediately, as aforesaid, shall forfeit the sum of L. 100 for each offence.

FINIS.

